Notice of Allowability	Application No.	Applicant(s)	
	10/766,421	KUDOH ET AL.	
	Examiner	Art Unit	
	Yong D. Pak	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the RCE filed on October 5, 2006*.

2. ☒ The allowed claim(s) is/are *15,16,18,21,25-31,35-38,40,42,48 and 49-52*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☒ Certified copies of the priority documents have been received in Application No. *09/978,758* .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☒ Other *email of amendment*.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 5, 2006 has been entered. The after final amendment filed on August 3, 2006, has been entered.

Claims 15-16, 18, 21 and 25-47 are pending.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ms. Collazo on December 11, 2006.

An email transmission submitted on December 11, 2006, amending claims 15, 28, 30-31, 37-38, and 40, canceling claims 32-34, 39, 41 and 43-47 and adding claims 48-52, is attached to this action.

The application has been amended as follows:

IN THE CLAIMS:

See attachment for amendment of claims 15, 28, 30-31, 37-38, and 40, cancelation of claims 32-34, 39, 41 and 43-47 and addition of claims 48-52.

Allowable Subject Matter

Claims 15-16, 18, 21, 25-31, 35-38, 40, 42 and 48-52 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yong Pak whose telephone number is 571-272-0935. The examiner can normally be reached 6:30 A.M. to 5:00 P.M. Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on 571-272-0928. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

Yong D. Pak
Patent Examiner 1652

P. Achutamurthy
Supervisory Patent Examiner 1652

PONNATHAPU ACHUTAMURTHY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600

Email attachment

Appendix
Proposed new claims
Date: December 7, 2006
Your Ref.: D1-A0001YIP-USD1
Our Ref.: 14879-090002

Applicant : Masatake Kudoh et al.
Serial No. : 10/766,421
Filed : January 27, 2004
Title : (R)-2-OCTANOL DEHYDROGENASES, METHODS FOR PRODUCING THE ENZYMES, DNA ENCODING THE ENZYMES, AND METHODS FOR PRODUCING ALCOHOLS USING THE ENZYMES

1.-14. (Canceled)

15. (Currently amended) A method for producing an (S)-4-halo-3-hydroxybutyric acid ester derivative, the method comprising reacting an (R)-2-octanol dehydrogenase having a molecular weight of about 30,000 Da as determined by SDS-PAGE and about 83,000 Da as determined by gel filtration, or a microorganism producing the (R)-2-octanol dehydrogenase, with a 4-haloacetoacetic acid ester derivative to reduce the 4-haloacetoacetic acid ester derivative, wherein the (R)-2-octanol dehydrogenase is a polypeptide chosen ~~selected~~ from (a) or (b) ~~the group from (a) to (e)~~ below:

~~(a) a polypeptide encoded by a polynucleotide that hybridizes under stringent conditions with a nucleic acid probe consisting of the complement of the nucleotide sequence of SEQ ID NO: 1, wherein the stringent conditions comprise washing in 0.5 x SSC at 42°C;~~

~~(b)~~ (a) a polypeptide comprising an amino acid sequence at least ~~70%~~ 95% identical to the amino acid sequence of SEQ ID NO:2; or

~~(c)~~ (b) a polypeptide comprising the amino acid sequence of SEQ ID NO:2.~~;~~

~~(d) a polypeptide comprising an amino acid sequence that is a variant of SEQ ID NO:2 with up to 50 conservative amino acid substitutions; and~~

~~(e) a polypeptide comprising an amino acid sequence that is a variant of SEQ ID NO:2 with up to 10 conservative amino acid substitutions.~~

16. (Previously presented) The method of claim 15, wherein the microorganism is a transformant comprising a recombinant vector into which a polynucleotide encoding the (R)-2-octanol dehydrogenase is inserted.

17. (Canceled)

18. (Previously presented) The method of claim 15, wherein the 4-haloacetoacetic acid ester derivative is 4-chloroacetoacetic acid ethyl ester and wherein the (S)-4-halo-3-hydroxybutyric acid ester derivative is (S)-4-chloro-3-hydroxybutyric acid ethyl ester.

19. (Canceled)

20. (Canceled)

21. (Previously presented) The method of claim 15, the method further comprising converting an oxidized form of β-nicotinamide adenine dinucleotide into a reduced form thereof.

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Previously presented) The method of claim 15, wherein the (R)-2-octanol dehydrogenase has an optimal pH for the reduction reaction in a range from 5.0 to 6.5.

26. (Previously presented) The method of claim 15, wherein the reacting step is carried out with the microorganism producing the (R)-2-octanol dehydrogenase, and said microorganism belongs to the genus *Candida* or the genus *Ogataea*.

27. (Previously presented) The method of claim 15, wherein the reacting step is carried out with the microorganism producing the (R)-2-octanol dehydrogenase, and the microorganism belongs to the genus *Pichia*.

28. (Currently amended) The method of claim 15, wherein the (R)-2-octanol dehydrogenase is at least 75% pure, has been treated with an organic solvent, or is in a cell-free extract.

29. (Previously presented) The method of claim 15, further comprising using a reduced form of β-nicotinamide adenine dinucleotide (NADH) as a coenzyme.

30. (Currently amended) The method of claim 48 ~~15~~, wherein the (R)-2-octanol dehydrogenase is encoded by a polynucleotide that hybridizes under stringent conditions with a nucleic acid probe consisting of the complement of the nucleotide sequence of SEQ ID NO: 1, wherein the stringent conditions comprise washing in 0.2 X SSC in 0.1% SDS at 65°C. ~~0.5 x SSC at 42°C.~~

31. (Currently amended) The method of claim 15, wherein the (R)-2-octanol dehydrogenase comprises an amino acid sequence at least 95% ~~70%~~ identical to the amino acid sequence of SEQ ID NO: 2.

32-34 (Canceled)

35. (Previously presented) The method of claim 15, wherein the (R)-2-octanol dehydrogenase comprises the amino acid sequence of SEQ ID NO: 2.

36. (Previously presented) The method of claim 35, wherein the (R)-2-octanol dehydrogenase consists of the amino acid sequence of SEQ ID NO: 2.

37. (Currently amended) The method of claim 48 ~~15~~, wherein the (R)-2-octanol dehydrogenase comprises an amino acid sequence that is a variant of SEQ ID NO:2 with up to ~~50~~ 30 conservative amino acid substitutions.

38. (Currently amended) The method of claim 48 ~~15~~, wherein the (R)-2-octanol dehydrogenase comprises an amino acid sequence that is a variant of SEQ ID NO:2 with up to 10 conservative amino acid substitutions.

39. (Canceled)

40. (Currently amended) A method for producing an (S)-4-halo-3-hydroxybutyric acid ester derivative, the method comprising reacting (i) ~~a *Pichia*~~ an (R)-2-octanol dehydrogenase, or a microorganism producing the ~~*Pichia*~~ (R)-2-octanol dehydrogenase, with (ii) a 4-haloacetoacetic acid ester derivative to reduce the 4-haloacetoacetic acid ester derivative, wherein the (R)-2-octanol dehydrogenase oxidizes the S form of (R)-2-octanol with an activity of 50 or less when taking the activity on R form as 100, wherein the (R)-2-octanol dehydrogenase is a polypeptide chosen from (a) or (b) below:

(a) a polypeptide comprising an amino acid sequence at least 95% identical to the amino acid sequence of SEQ ID NO:2; or

(b) a polypeptide comprising the amino acid sequence of SEQ ID NO:2.

41. (Canceled)

42. (Currently amended) The method of claim 40, wherein the (R)-2-octanol dehydrogenase is obtained from *Pichia*, or a transformant comprising a recombinant vector into which a polynucleotide encoding the (R)-2-octanol dehydrogenase from *Pichia* is inserted. ~~is *Pichia finlandica*~~.

43-47. (Canceled)

48. (New) A method for producing an (S)-4-halo-3-hydroxybutyric acid ester derivative, the method comprising reacting an (R)-2-octanol dehydrogenase having a molecular weight of about 30,000 Da as determined by SDS-PAGE and about 83,000 Da as determined by gel filtration, or a microorganism producing the (R)-2-octanol dehydrogenase, with a 4-haloacetoacetic acid ester derivative to reduce the 4-haloacetoacetic acid ester derivative, wherein the (R)-2-octanol dehydrogenase is a polypeptide chosen from (a) or (c) below:

(a) a polypeptide encoded by a polynucleotide that hybridizes under stringent conditions with a nucleic acid probe consisting of the complement of the nucleotide sequence of SEQ ID NO: 1, wherein the stringent conditions comprise washing in 0.2 X SSC in 0.1% SDS at 65°C;

(b) a polypeptide comprising an amino acid sequence that is a variant of SEQ ID NO:2 with up to 30 conservative amino acid substitutions; or

(c) a polypeptide comprising an amino acid sequence that is a variant of SEQ ID NO:2 with up to 10 conservative amino acid substitutions.

49. (New) A method for producing an (S)-4-halo-3-hydroxybutyric acid ester derivative, the method comprising reacting (i) an (R)-2-octanol dehydrogenase, or a microorganism producing the (R)-2-octanol dehydrogenase, with (ii) a 4-haloacetoacetic acid ester derivative to reduce the 4-haloacetoacetic acid ester derivative, wherein the (R)-2-octanol dehydrogenase oxidizes the S form of (R)-2-octanol with an activity of 50 or less when taking the activity on R form as 100, wherein the (R)-2-octanol dehydrogenase is a polypeptide chosen from (a) or (c) below:

(a) a polypeptide encoded by a polynucleotide that hybridizes under stringent conditions with a nucleic acid probe consisting of the complement of the nucleotide sequence of SEQ ID NO: 1, wherein the stringent conditions comprise washing in 0.2 X SSC in 0.1% SDS at 65°C;

(b) a polypeptide comprising an amino acid sequence that is a variant of SEQ ID NO:2 with up to 30 conservative amino acid substitutions; or

(c) a polypeptide comprising an amino acid sequence that is a variant of SEQ ID NO:2 with up to 10 conservative amino acid substitutions.

50. (New) The method of claim 42, wherein the *Pichia* is *Pichia finlandica*.

51. (New) The method of claim 49, wherein the (R)-2-octanol dehydrogenase is obtained from *Pichia*, or a transformant comprising a recombinant vector into which a polynucleotide encoding the (R)-2-octanol dehydrogenase from *Pichia* is inserted.

52. (New) The method of claim 51, wherein the *Pichia* is *Pichia finlandica*.